

REMARKS/ARGUMENTS

Claim 10 is added. Claims 1-9 remain active in the application. The claims now in the application are 1-10.

Claim 1 is amended to convert the generic plural “polydienes” to the singular indefinite “a polydiene” which has a generic connotation, for the purposes of removing possible ambiguity. It is not required that more than one polydiene be presented, [0037] page 10, the paragraph at line 15. (Please note: the bracketed paragraphs refer to the published application, U.S. 2004/0127665 A1.

Claim 1 is also amended to a substitute “carbon” for “Carbon” as suggested.

Claim 2 is amended to convert it from a more limited generic claim to a claim to the isothermal polymerization (i) alternative.

Claim 3 is amended to employ conventional Markush language. Basis for “at least one” appears in the above-noted paragraph [0037].

New Claim 10 is directed to the adiabatic polymerization.

The specification is amended to remove “comparative” from the Example 5 title. The Example 5 is an example of the invention, please see Table 2 and page 24, lines 17-19, as well as Table 5.

The Rejections

Reconsideration and withdrawal of the rejection to Claim 1, because of the following informalities: the two occurrences of “Carbon” should not be capitalized, are requested.

The appropriate corrections have been made.

Reconsideration and withdrawal of the rejection of Claims 1-9 under 35 U.S.C. § 102(b) as anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as obvious over EP 0 863 165 A1 (“Sone”) are requested.

After itemizing relevant specific recitations in Comparative Example 4 of the applied reference, Sone. The Final rejection states:

As such, Sone is seen to describe all the positive process limitations of claim 1 in an embodiment in which the polymerization period corresponds to a reaction time for obtaining polydiene having the claimed values of branching index and alpha parameter.

Accordingly, there is a plausible basis for inferring that the polybutadiene obtained per the cited example of Sone will intrinsically possess the requisite values of branching index and alpha parameter. In other words, the subject matter of claim 1 appears to be inherently described by Sone. It follows that there is sufficient evidence in the record justify shifting the burden to applicants to demonstrate that the described process does not inherently anticipate the subject matter of claim 1.

In response thereto, Applicants first point out that Table 6(b), page 16, itemizes the properties of the Comparative Example 4 polymer (to which no modifying agent has been added, despite the heading in the Table).

A major purpose of the Sone procedure is to obtain a polymer of reduced cold flow, which is achieved, as stated in the Summary of the Invention, the paragraph bridging pages 2 and 3 of Sone, by polymerizing a conjugated diene to produce a polymer which is to be further treated to reduce cold flow. The polymerizing is under conditions similar to those that may be employed in the subject application but not as extended. Sone discloses that their desired result is obtained by further reacting the resultant polymer just after polymerization with a specified halide or other named reactants.

The Sone Comparative Example 4 polymer is a polymer that has not been so treated. Its cold flow (mg/min) is tabulated in Table 6(b) as 15.0. This is contrasted with a cold flow range of 0.3 (Example 13) -1.8 (Example 13) for the examples of the Sone invention.

Other tabulated properties of the Comparative example, Mooney viscosity, cis-1-4-bond and vinyl-1-2-bond (Comparative Example 4), are similar to those of the examples of the Sone invention.

More specifically, Applicants point out that in Table 6(b) of Sone, the product of the Comparative Example 4 presents a “cold flow” of 15.0 mg/min, while the products of Examples 21 and 22 (modified according to the invention Sone), having the same Mooney viscosity and substantially the same cis-1,4 and vinyl values, present definitely lower “cold flow” (1.6 and 1.7) an index indicates that the product of Example 4 is linear while those of Examples 21 and 22 are branched.

Therefore, comparing the process of Comparative Example 4 of Sone with that of subject Claim 1 of the application in re, the novelty element, which guarantees also the inventive step of the invention, this is represented by the working condition of maintaining isothermal conditions up to obtaining the wished branching degree (step (i) of claim 1).

It is evident that the polymerization at 80°C for 1 hr. does not achieve that result in view of the high cold flow value reported versus those of the treated polymer.

As to polymerization temperature, Applicants disclose [0045], paragraph at page 12, line 12.

[0045] The polymerization temperature must be selected so as to allow the development of cross-linking reactions between the polymeric chains which can take place either during or at the end of the polymerization itself. Under isothermal conditions, the temperature ranges from 70° to 140°C, preferably from 80°C to 120°C.

As for polymerization time or reaction time, Applicants disclose [0047], page 12, line 33.

[0047] The reaction time is selected so as to allow the reactions which generate branched polymeric structures, to take place with a sufficient extension to obtain branching index values (measured with the GPC-MALLS technique) lower than

0.90 and α parameter values (also measured with the GPC-MALLS technique) ranging from 0.53 to 0.30. Depending on the polymerization conditions, the reaction time generally adopted ranges from 5 to 360°C, preferably from 30 to 180'.

Both process conditions have to be of sufficient extent to allow the development of cross linking and/or chain branching.

The Sone temperature of 80°C is at the lower limit of Applicants' disclosed preferred range. The Sone time of 1 hr. is only 1/3 of the 180 minutes preferred upper limit.

It is therefore evident, Applicants submit, that Sone, in view of the high cold flow reported, does not carry out, in Comparative Example 4, an extensive enough polymerization reaction to anticipate the here claimed process as defined in Claim 1 specifying precisely that

the above process being continued under conditions (i) or (ii) until a polydiene is obtained, having branching index values (measured with the GPC-MALLS technique (lower than 0.90 and α parameter values (also measured with GPC-MALLS technique) ranging from 0.53 to 0.30.

Sone does not disclose maintaining isothermal conditions up to obtaining the here wished branching degree.

The claims are therefore not anticipated.

No motivation can be found in Sone to carryout such a process. In fact, Sone teaches reacting the initially produced polymer with one of specified named compounds and thus teaches away from the subject invention. The claims are therefore not obvious over Sone,

New Claim 10 is further removed from the Sone Comparative Example 4 relied upon which does not teach adiabatic conditions.

Favorable reconsideration is solicited.

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